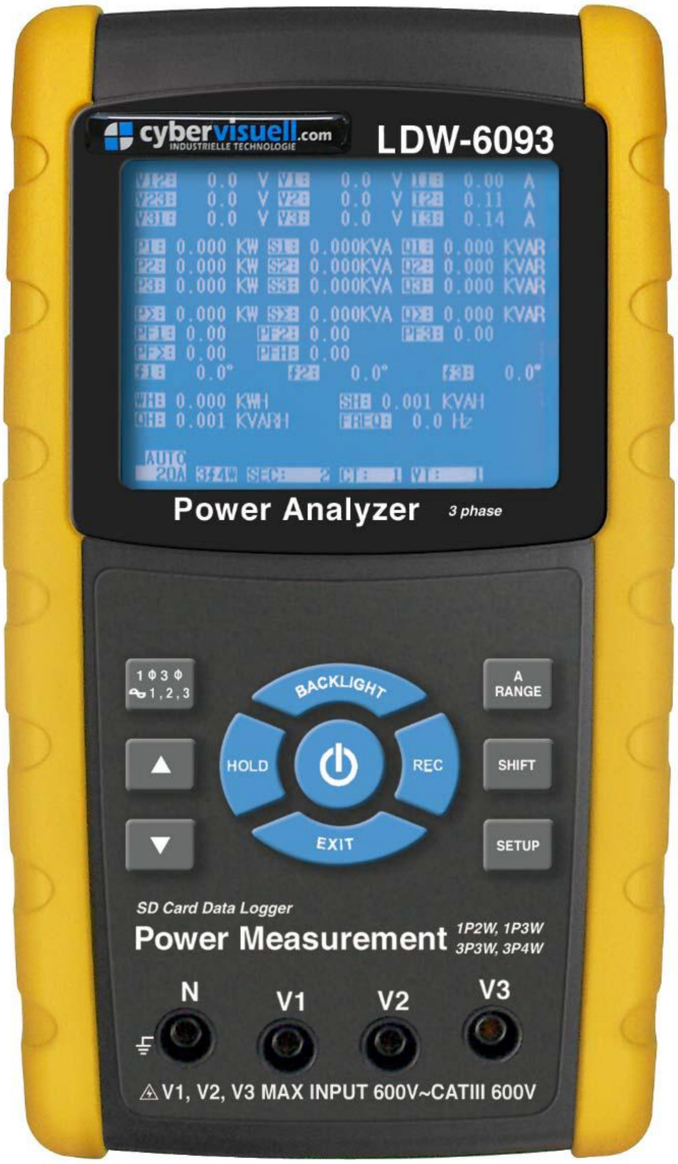
# 3 Phase Power Analyser / Data Logger

**Model LDW-6093K**



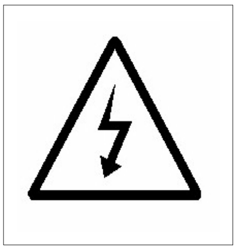

Your purchase of this 3 PHASE POWER ANALYZER marks a step forward for you into the field of precision measurement.

Although this POWER ANALYZER is a complex and delicate instrument, its durable structure will allow many years of use if proper operating techniques are developed.

Please read the following instructions carefully and always keep this manual within easy reach.

# OPERATION MANUAL

## Caution Symbol



***Caution :***

*** Risk of electric shock !**

*** During the measurement, do not open the cabinet.**



***Caution :***

*** Do not apply the overload voltage, current to the input terminal !**

*** Remove test leads before open the battery cover !**

*** Cleaning - Only use the dry cloth to clean the plastic case !**

## Environment Conditions

* Installation Categories III 600V.

* Pollution Degree 2.

* Altitude up to 2000 meters.

* Indoor use.

* Relative humidity 80% max.

# TABLE OF CONTENTS

# 1. FEATURES

* Analysis for 3 phase multi-power system, 1P/2W, 1P/3W, 3P/3W, 3P/4W
* Voltage & Current are the True RMS value.
* True Power ( KW、MW、GW ) measurement.
* Apparent Power ( KVA、MVA、GVA ) measurement.
* Reactive Power ( KVAR MVAR、GVAR) measurement.
* Watt-Hour ( WH、SH、QH、PFH ).
* Power Factor( PF )、Phase Angle( Φ ).
* Voltage measurement range : 10 to 600 ACV
* Current probe input signal volage ( ACV ) :
  200 mV/300 mV/500 mV/1 V/2 V/3 V.
  Current probe input current range ( ACA ) :
  20 A/200 A/2000 A ( 1200 A )/30 A/300A /3000 A.
* Meter can cooperate the universal current probe.
* Programmable CT ratio (1 to 600) and PT ratio (1 to 1000).
* ACV input impedance is 10 Mega ohms.
* Safety Standard : IEC 1010, CAT III 600V
* Built-in clock and Calendar, real time data record with SD memory card , sampling time set from 2 to 7200 seconds. Just slot in the SD card into the computer, it can down load the all the measured value with the time information ( year/month/data/ hour/minute/second ) to the Excel directly, then user can make the further data analysis by themselves.
* Complete set with 4 PCs Test Leads, 4 PCs Alligator clips, 3 PCs Clamp Probe ( CP-1201 ), AC to DC 9V adapter, 2 G SD memory card and Carrying bag.
* Computer data output, can cooperate with USB Cable /USB-01 RS232 cable/UPCB-02 and Data Acquisition software, SW-U811-WIN.

# 2. SPECIFICATIONS

## *2-1 General Specifications:*

| | | |
|---|---|---|
| Circuit | Custom one-chip of microprocessor LSI circuit | |
| Display | * LCD Size :<br>81.4 X 61 mm ( 3.2 X 2.4 inch )<br>* Dot Matrix LCD (320 X 240 pixels )<br>with back light. | |
| Measurement | * ACV<br>* ACA<br>* AC WATT ( True Power )<br>AC WATT( Apparent Power )<br>AC WATT( Reactive Power )<br>* Power factor<br>* Phase angle<br>* Frequency | |
| Wire connections | 1P/2W, 1P/3W, 3P/3W, 3P/4W. | |
| Voltage ranges | 10 ACV to 600 ACV, auto range. | |
| Current probe input signal and range | * Current probe input signal volage ( ACV ) :<br>*200mV/300mV/500mV/1V/2V/3V.*<br>* Current probe input current range ( ACA ) :<br>*20 A/200A/2000A (1200 A)/30A/300A/3000A*<br>* Meter can cooperate the universal current probe. | |
| Safety standard | IEC1010 CAT III 600 V. | |
| ACV input impedance | 10 Mega ohms. | |
| Range select | ACV | Auto range. |
| | ACA | Manual range. |
| Clamp frequency response | 40 Hz to 1 KHz. | |
| Spec. tested frequency | 45 to 65 Hz. | |

| | | |
|---|---|---|
| Over load protection | ACV | 720 ACV rms |
| | ACA | 1300 ACA with clamp probe<br>** For the Clamp ,CP-1201* |
| Over Indicator | * LCD display show " OL ".<br>* The data save into the SD card will show " 9999 " or " 999 "( overleap the decimal point ). | |
| Under Indicator | * LCD display show " UR ".<br>* The data save into the SD card will show " 9999 " or " 999 "( overleap the decimal point ). | |
| Data Hold | Freeze the display reading. | |
| Data Record | SD Card Record. | |
| Sampling Time | Approx. 1 second. | |
| Power ON/OFF | Manual OFF by push button. | |
| Real time data logger | * Real time data logger, saved the data into SD memory card and down load the all the measured value with the time information ( year/month/data/ hour/minute/second ) down load to the Excel | |
| | * Integration time for data logger : 2 seconds to 7200 seconds, the during of setting step are 2 seconds. | |
| Data Output USB/RS232<br>** Computer interface* | RS232 computer serial interface :<br>* Connect the optional USB cable USB-01 will get the USB plug.<br>* Connect the optional RS232 cable UPCB-02 will get the RS232 plug. | |
| Operating Temperature | 0 to 50℃ ( 32 to 122°F ). | |
| Operating Humidity | Less than 80% R.H.. | |
| Power Supply | * DC 1.5V, AA ( UM-3 ) Battery X 8 PCs (Alkaline or heavy-duty battery).<br>* AC to DC 9V power adapter. | |

| | |
|---|---|
| Power Consumption | * Meter : 250 DCmA.<br>* Clamp : 22 DCmA. |
| Clamp max. conductor Size | 50 mm ( 2.0 inch ) Dia.<br>** For the Clamp ,CP-1201* |
| Weight | * Meter : 975g ( includes batteries )<br>* Clamp ( includded cable ) : 500g |
| Dimension | *Meter :*<br>225 X 125 X 64 mm<br>( 8.86 X 4.92 X 2.52 inch ) |
| | *Clamp :*<br>210 X 64 X 33mm<br>( 8.3 X 2.5 X 1.3 inch ) |
| | Clamp Jaw : 86 mm (3.4 inch)- outside |
| Accessories Included | * Instruction manual..............1 PC<br>* Test Leads (TL88-4AT)........1 Set (4 PCs)<br>* Alligator clips (TL88-4AC) 1 Set (4 PCs)<br>* Clamp Probe ( CP-1201 ).....3 PCs<br>* AC to DC 9V adapter...........1 PC<br>* SD card ( 2 G )....................1 PC<br>* Carrying bag....................... 1 PC |
| Optional Accessories | * 2000 Amp current probe, CP-2000<br>* 200 Amp current probe, CP-200<br>* Flexible 3000 Amp current probe, CP-3000<br>* USB Cable , USB-01<br>* RS232 cable, UPCB-02<br>* Data Acquisition software, SW-U811<br>* EXCEL Data Acquisition software, SW-E802 |

## *2-2 Electrical Specifications:*

**ACV**

| ***Range*** | ***Resolution*** | ***Accuracy*** |
|---|---|---|
| 10.0V to 600.0V<br>** Phase to neutral line* | 0.1V | ± (0.5%+0.5V) |
| 10.0V to 600.0V<br>** Phase to phase* | | |

## ACA

| ***Range*** | ***Resolution*** | ***Accuracy*** |
|---|---|---|
| 20A | 0.001A, *< 10 A*<br>0.01A, *≧ 10 A* | ± (0.5%+0.1A) |
| 200A | 0.01A, *< 100 A*<br>0.1A, *≧ 100 A* | ± (0.5%+0.5A) |
| 1200A | 0.1A, *< 1000 A*<br>1A, *≧ 1000 A* | ± (0.5%+5A) |

## Power factor

| ***Range*** | ***Resolution*** | ***Accuracy*** |
|---|---|---|
| 0.00 to 1.00 | 0.01 | ± 0.04 |

***Remark :***

*** PFH : Long term power factor**

*** PFΣ :**

*For 3Φ 4W, 3Φ 3W*

PFΣ = ( PF1 + PF2 + PF3 )/3

*For 1Φ 3W*

PFΣ = ( PF1 + PF2 )/2

## Φ ( Phase angle )

| ***Range*** | ***Resolution*** | ***Accuracy*** |
|---|---|---|
| -180° to 180° | 0.1° | ± 1° ** ACOS ( PF )* |

## Frequency

| ***Range*** | ***Resolution*** | ***Accuracy*** |
|---|---|---|
| 45 to 65 Hz | 0.1 Hz | 0.1 Hz |

## Active (Real) Power

| ***Range*** | ***Resolution*** | *Accuracy* |
|---|---|---|
| 0.000 to 9.999 KW | *0.001/0.01/0.1 KW | ± (1%+0.008KW) |
| 10.00 to 99.99 KW | *0.01/0.1 KW | ± (1%+0.08KW) |
| 100.0 to 999.9 KW | 0.1 KW | ± (1%+0.8KW) |
| 1.000 to 9.999 MW | 0.001 MW | ± (1%+0.008MW) |

** : The resolution is changed according the different ACA range.*

## Apparent Power

| ***Range*** | ***Resolution*** | ***Accuracy*** |
|---|---|---|
| 0.000 to 9.999 KVA | *0.001/0.01/0.1KVA | ± (1%+0.008KVA) |
| 10.00 to 99.99 KVA | *0.01/0.1 KVA | ± (1%+0.08KVA) |
| 100.0 to 999.9 KVA | 0.1 KVA | ± (1%+0.8KVA) |
| 1.000 to 9.999 MVA | 0.001 MVA | ± (1%+0.008MVA) |

** : The resolution is changed according the different ACA range.*

## Reactive Power

| ***Range*** | ***Resolution*** | ***Accuracy*** |
|---|---|---|
| 0.000 to 9.999 KVAR | *0.001/0.01/0.1KVAR | ± (1%+0.008 KVAR) |
| 10.00 to 99.99 KVAR | *0.01/0.1 KVAR | ± (1%+0.08 KVAR) |
| 100.0 to 999.9 KVAR | 0.1 KVAR | ± (1%+0.8 KVAR) |
| 1.000 to 9.999 MVAR | 0.001 MVAR | ± (1%+0.008 MVAR) |

** : The resolution is changed according the different ACA range.*

## Watt Hour ( Active Power Hour) : WH

| ***Range*** | ***Resolution*** | ***Accuracy*** |
|---|---|---|
| 0.000 to 9.999 KWH | 0.001 KWH | ± (2%+0.008 KWH) |
| 10.00 to 99.99 KWH | 0.01 KWH | ± (2%+0.08 KWH) |
| 100.0 to 999.9 KWH | 0.1 KWH | ± (2%+0.8 KWH) |
| 1.000 to 9.999 MWH | 0.001 MWH | ± (2%+0.008 MWH) |

## VA Hour ( Apparent Power Hour ) : SH

| ***Range*** | ***Resolution*** | ***Accuracy*** |
|---|---|---|
| 0.000 to 9.999 KVAH | 0.001 KVAH | ± (2%+0.008 KVAH) |
| 10.00 to 99.99 KVAH | 0.01 KVAH | ± (2%+0.08 KVAH) |
| 100.0 to 999.9 KVAH | 0.1 KVAH | ± (2%+0.8 KVAH) |
| 1.000 to 9.999 MVAH | 0.001 MVAH | ± (2%+0.008 MVAH) |

## VAR Hour ( Reactive Power Hour ) : QH

| ***Range*** | ***Resolution*** | *Accuracy* |
|---|---|---|
| 0.000 to 9.999 KVARH | 0.001 KVARH | ± (2%+0.008 KVARH) |
| 10.00 to 99.99 KVARH | 0.01 KVARH | ± (2%+0.08 KVARH) |
| 100.0 to 999.9 KVARH | 0.1 KVARH | ± (2%+0.8 KVARH) |
| 1.000 to 9.999 MVARH | 0.001 MVARH | ± (2%+0.008 MVARH) |

# 3. FRONT PANEL DESCRIPTION

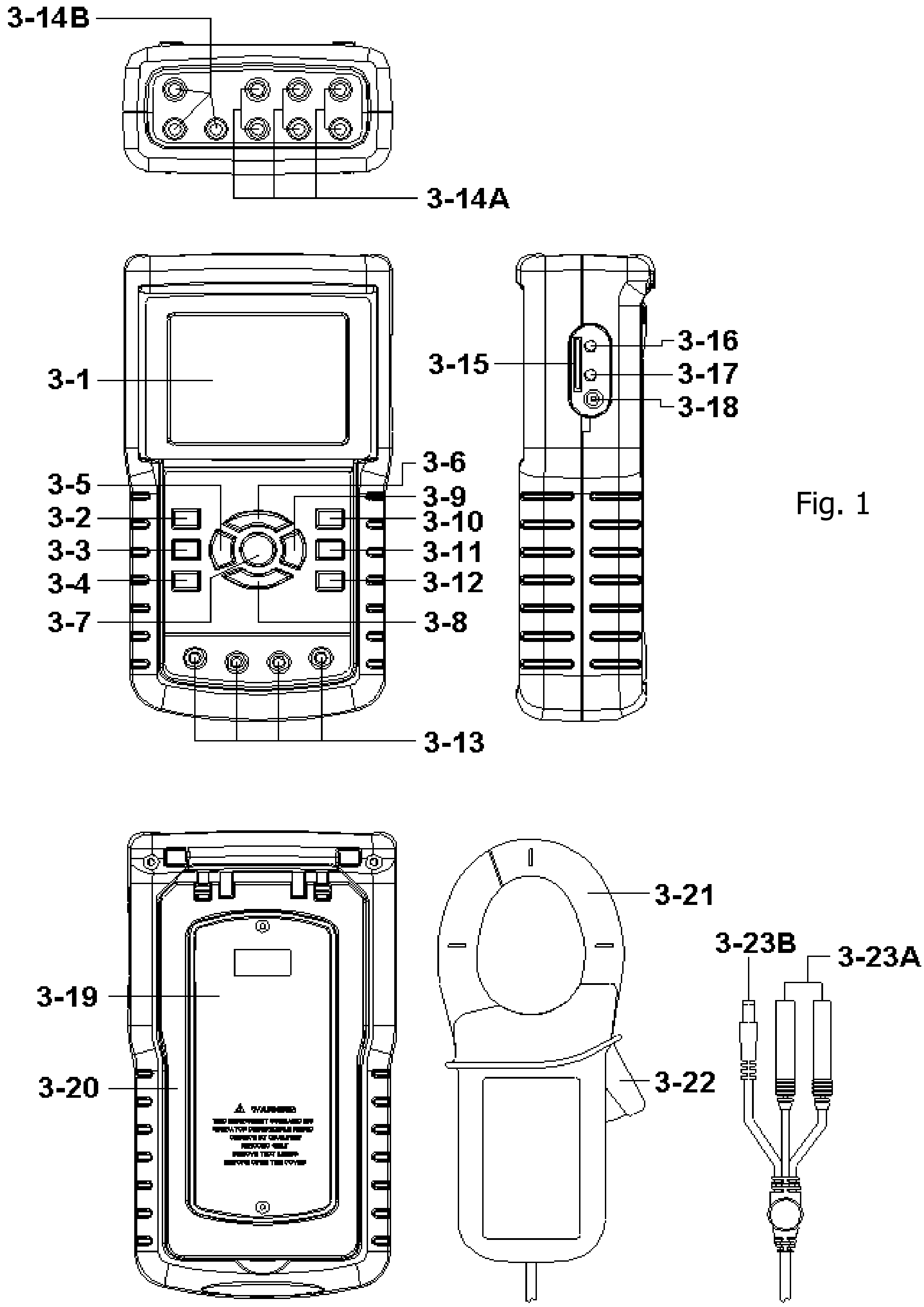
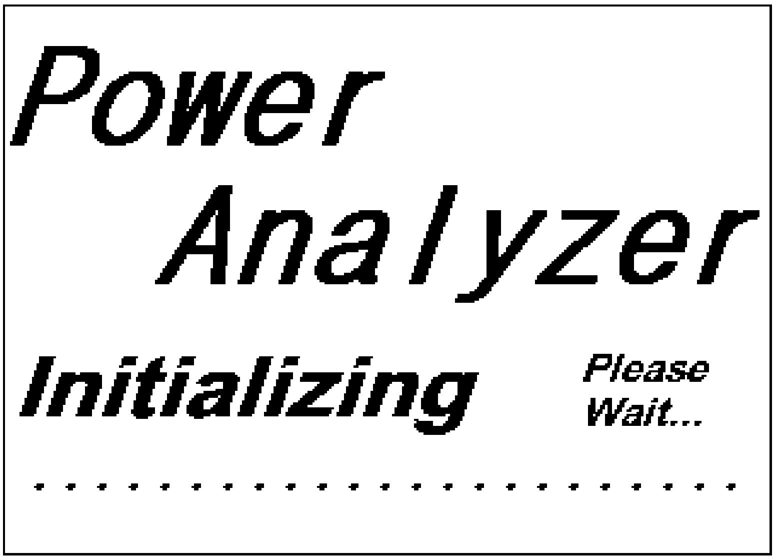



Fig. 1

3-1 Display
3-2 1Φ 3Φ ( Phase/wire ) key button
3-3 ▲ key button
3-4 ▼ key button
3-5 Hold key button
3-6 Backlight key button
3-7 Power key button
3-8 Exit key button
3-9 REC key button
3-10 A ( current ) range key button
3-11 Shift key button
3-12 Setup key button
3-13 Voltage input terminals
3-14A Current probe signal input sockets
3-14B Current probe power sockets
3-15 SD card socket
3-16 RS232 socket
3-17 Reset button
3-18 DC 9V power adapter socket
3-19 Battery Cover/Battery compartment
3-20 Stand
3-21 Current Sense Jaw
3-22 Trigger
3-23A Current probe signal plugs
3-23B Current probe power plug

# 4. MEASURING PREPARATION

### *4-1 The original screen*




### *4-2 Entry the measurement Screen*

1) The bottom right display of screen 1 will show as " SD Check " along with blinking while inserting SD CARD then disappears after several seconds that indicates the data from SD CARD has been read completed.
2) The bottom right display of screen 2 will show as " NO DISK " along with blinking when SD CARD is not inserted.

screen 1 ( 4-2 )

| | | | | | |
|---|---|---|---|---|---|
| **V12:** | 0.0 V | **V1:** | 0.0 V | **A1:** | 0.00 A |
| **V23:** | 0.0 V | **V2:** | 0.0 V | **A2:** | 0.00 A |
| **V31:** | 0.0 V | **V3:** | 0.0 V | **A3:** | 0.00 A |
| **P1:** | -0.000 KW | **S1:** | 0.000KVA | **Q1:** | -0.000 KVAR |
| **P2:** | -0.000 KW | **S2:** | 0.000KVA | **Q2:** | -0.000 KVAR |
| **P3:** | -0.000 KW | **S3:** | 0.000KVA | **Q3:** | -0.000 KVAR |
| **PΣ :** | -0.000 KW | **SΣ :** | 0.000KVA | **QΣ :** | -0.000 KVAR |
| **PF1:** | -0.00 | **PF 2:** | -0.00 | **PF 3:** | -0.00 |
| **PFΣ :** | 0.00 | **PF H:** | 0.00 | | |
| **Φ1:** | - 0.0° | **Φ2:** | - 0.0° | **Φ3:** | - 0.0° |
| **WH:** | 0.000 KWH | **SH:** | 0.000KVAH | | |
| **QH:** | 0.000 KVARH | **FREQ:** | 0.0 Hz | | |

| | | | | | |
|---|---|---|---|---|---|
| **CP1201 20A** | **3Φ4W** | **SEC: 2** | **CT: 1** | **PT: 1** | **SD Check** |

screen 1 ( 4-2 )

| | | | | | |
|---|---|---|---|---|---|
| **V12:** | 0.0 V | **V1:** | 0.0 V | **A1:** | 0.00 A |
| **V23:** | 0.0 V | **V2:** | 0.0 V | **A2:** | 0.00 A |
| **V31:** | 0.0 V | **V3:** | 0.0 V | **A3:** | 0.00 A |
| **P1:** | -0.000 KW | **S1:** | 0.000KVA | **Q1:** | -0.000 KVAR |
| **P2:** | -0.000 KW | **S2:** | 0.000KVA | **Q2:** | -0.000 KVAR |
| **P3:** | -0.000 KW | **S3:** | 0.000KVA | **Q3:** | -0.000 KVAR |
| **PΣ :** | -0.000 KW | **SΣ :** | 0.000KVA | **QΣ :** | -0.000 KVAR |
| **PF1:** | -0.00 | **PF 2:** | -0.00 | **PF 3:** | -0.00 |
| **PFΣ :** | 0.00 | **PF H:** | 0.00 | | |
| **Φ1:** | - 0.0° | **Φ2:** | - 0.0° | **Φ3:** | - 0.0° |
| **WH:** | 0.000 KWH | **SH:** | 0.000KVAH | | |
| **QH:** | 0.000 KVARH | **FREQ:** | 0.0 Hz | | |

| | | | | | |
|---|---|---|---|---|---|
| **CP1201 20A** | **3Φ4W** | **SEC: 2** | **CT: 1** | **PT: 1** | **NO DISK** |

***4-3 The summary description of keyboard***

1) POWER KEY ( 3-7, Fig. 1 ) :
   Press the key to turn the instrument ON/OFF.
2) 1Φ 3Φ ( phase/wire ) KEY ( 3-2, Fig. 1 ) :
   Press the key to select
   (1P/2W、1P/3W、3P/3W、3P/4W) measurement function mode.
3) A ( current ) RANGE KEY ( 3-10, Fig. 1 ) :
   Press the key to change the current range quickly.
4) REC KEY ( 3-9, Fig. 1 ) :
   The data record key for SD CARD.
5) HOLD KEY ( 3-5, Fig. 1 ) :
   Press the key to freeze the display reading.
6) BACKLIGHT KEY ( 3-6, Fig. 1 ) :
   Press the key to switch LCD backlight to ON/OFF.
7) SETUP KEY ( 3-12, Fig. 1 ) :
   Press the key to setup the function before measuring.
8) EXIT KEY ( 3-8, Fig. 1 ) :
   Press the key to exit setting screen.
9) SHIFT KEY ( 3-11, Fig. 1 )
   Press the key to set the different functions in setting screen.
10) UP (▲) KEY ( 3-3, Fig. 1 ) :
    Press the key to move the cursor up in setting screen.
11) DOWN (▼) KEY ( 3-4, Fig. 1 ) :
    Press the key to move the cursor down in setting screen.

## *4-4 SETUP KEY description:*

### 4-4-1 SHIFT KEY

* SHIFT 1 : When the symbols " SETUP " and " SHIFT 1 " are appeared on up right display of screen 1 in the meantime, and then use the ▲ or ▼ to select the expect item.

* SHIFT 2 : When the symbols " SETUP " and " SHIFT 2 " are appeared on up right display of screen 2 in the meantime, and then use the ▲ or ▼ to select ( 1P/2W、1P/3W、3P/3W、3P/4W ) in File Name function.

```
Folder Name:        WTA01                                  SETUP
File Name:          3P401001.XLS                           SHIFT 1  ◄——
REC Date:      2008-11-28 00:03:17
Sampling Time:          2
Delet File:           0  %        Decimal:          Basic
SD Format:            0  %        Clamp Type:   CP1201
Use Size:           388   KB      A       Range:      20A
Free Size:          1946 MB       V       Range:  200mV
Total Size:         1946 MB       RS232 Out Sel:

PT:                 1 : 1         V1      I1        P1
CT:                 1 : 1         S1      Q1        PF1
Beep:    ON                       Φ1      WH        FREQ

Year     Month      Date     Hour     Minute     Second
2010     11         13       14       37         25
```

```
Folder Name:        WTA01                                  SETUP
File Name:          3P401001.XLS                           SHIFT 2  ◄——
REC Date:      2008-11-28 00:03:17
Sampling Time:          2
Delet File:           0  %        Decimal:          Basic
SD Format:            0  %        Clamp Type:   CP1201
Use Size:           388   KB      A       Range:      20A
Free Size:          1946 MB       V       Range:  200mV
Total Size:         1946 MB       RS232 Out Sel:

PT:                 1 : 1         V1      I1        P1
CT:                 1 : 1         S1      Q1        PF1
Beep:    ON                       Φ1      WH        FREQ

Year     Month      Date     Hour     Minute     Second
2010     11         13       14       37         25
```

screen 2 ( 4-4 )

## 4-4-2 The Setting Function menu

* Folder Name : Set the expect folder name for SD CARD, the range is between WTA01 and WTA10.
* File Name: Set the file name for SD CARD, It allows setting 50 filenames in this function.
* REC Date: Show the recorded time of existing files ( Year/Month/Date, Hour/Min./Sec. )
* Sampling Time : Set the sampling time from 2 to 7200 seconds.
* Delete File : To delete the existing data from SD CARD.
* SD Format : to Format SD CARD fast.
* PT : Set the potential transformer from 1 to 1000.
* CT : Set the current transformer from 1 to 600.
* Beep : Set to ON/OFF for buzzer.
* Clamp Type : Select the Clamp Type to CP-1201, CP-200 CP-2000, CP-3000 or Other Type.
* RS232 out Sel. : Set RS232 output function, maximum up to nine items can be selected to output. screen 1 screen 2.
* Year : Set the year.
* Month : Set the month.
* Date : Set the date.
* Hour : Set the hour.
* Minute : Set the minute.
* Second : Set the second.

## *4-5 Setting function description before measuring*

Press SETUP KEY to enter setting function screen, the selected item will be displayed in highlight.

## 4-5-1 Folder Name: Set the folder name for SD

screen 1 ( 4-5-1 )

| | | | | | |
|---|---|---|---|---|---|
| **Folder Name:** | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delet File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year | Month | Date | Hour | Minute | Second |
| 2010 | 12 | 05 | 11 | 14 | 49 |

screen 2 ( 4-5-1 )

| | | | | | |
|---|---|---|---|---|---|
| **Folder Name:** | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delet File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year | Month | Date | Hour | Minute | Second |
| 2010 | 12 | 05 | 11 | 14 | 34 |

A : Folder Name range: WTA01 to WTA10.
B : Press ▲ or ▼ to select the expect folder number, the number consists of " 01 to 10 " (as screen 1).
C : Press ▲ or ▼ continuously at least two seconds can skip the numbers faster.
D : Press SHIFT KEY once, the symbol " SHIFT1" will appear on up right display, and then press ▼ to entry next setting function as screen 2 (Folder Name → File Name).

## 4-5-2 File Name: Set the file name for SD

A : The screen will show " NO File " indicator in REC Date option when the selected file is new ( as screen 1 ).
B : The screen will show recording date and time in REC Date option when the selected file has been recorded as screen 2.

screen 1 ( 4-5-2 )

| | | | | | | |
|---|---|---|---|---|---|---|
| Folder Name: | WTA03 | | | | | **SETUP** |
| **File Name:** | 3P401001.XLS | | | | | |
| → REC Date: | NO File | | | | | |
| Sampling Time: | 2 | | | | | |
| Delet File: | 0 % | Decimal: | | Basic | | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | | |
| Use Size: | 388 KB | A | Range: | 20A | | |
| Free Size: | 1946 MB | V | Range: | 200mV | | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | | |
| Beep: ON | | Φ1 | WH | FREQ | | |
| Year | Month | Date | Hour | Minute | Second | |
| 2010 | 11 | 13 | 14 | 37 | 25 | |

screen 2 ( 4-5-2 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| **File Name:** | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delet File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year | Month | Date | Hour | Minute | Second |
| 2010 | 12 | 05 | 11 | 15 | 31 |

C : File Name description : press ▲ or ▼ in screen 2 to select expect file number from 001 to 050.

*Remark : When press ▲ or ▼ > 2 sec, the setting no. will change fast.*

* 1P201001 : 1P2 means one phase by two wires, 01 means folder number, 001 means file number.

* 1P301001: 1P3 means one phase by three wires, 01 means folder number, 001 means file number.

* 3P301001 : 3P3 means three phases by three wires, 01 means folder number, 001 means file number.

* 3P401001 : 3P4 means three phases by four wires, 01 means folder number, 001 means file number.

D : The up right display will show " SHIFT1 " symbol while pressing SHIFT KEY once in screen 2, and then press ▼ to enter next setting function as screen 3 ( File Name → Sampling Time ).

E : The up right display will show " SHIFT2 " symbol while pressing SHIFT KEY again in screen 4, at this time press ▲ or ▼ to select 1P/2W(1P2)、1P/3W(1P3)、3P/3W(3P3) and 3P/4W(3P4) as screen 4.

F: One by one to press SHIFT KEY to select different functions circularly.

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| **File Name:** | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delet File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year / Month | Date | Hour | Minute | Second | |
| 2010 / 11 | 13 | 14 | 37 | 25 | |

screen 3
(4-5-2)

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| **File Name:** | 3P401001.XLS | | | | **SHIFT 2** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delet File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year / Month | Date | Hour | Minute | Second | |
| 2010 / 11 | 13 | 14 | 37 | 25 | |

screen 4
( 4-5-2 )

## 4-5-3 Sampling time: Set the data logger sampling time for SD

A : When press SHIFT KEY once, the symbol " SHIFT1 " will disappear on up right display, at this time press ▲ or ▼ to adjust expect sampling time as screen 2, adjusting numbers are from 2 to 7200 seconds.

*Remark : When press ▲ or ▼ > 2 sec, the setting no. will change fast.*

B : The up right display will show " SHIFT1 " symbol while pressing SHIFT KEY again, and then press ▼ to enter next setting function (Sampling Time → Delete File)

screen 1 ( 4-5-3 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** ◄── |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| **Sampling Time:** | 2 | | | | |
| Delet File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year / Month | Date | Hour | Minute | Second | |
| 2010 / 11 | 13 | 14 | 37 | 25 | |

screen 2 ( 4-5-3 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| **Sampling Time:** | 2 | | | | |
| Delet File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year / Month | Date | Hour | Minute | Second | |
| 2010 / 11 | 13 | 14 | 37 | 25 | |

## 4-5-4 Delete File: Delete the files for SD

A : The indicator " Y or N " will appear on right side display of the option while pressing SHIFT KEY continuously at least two seconds, and now press ▲ the display will show " Y " in highlight as screen 2, press SETUP KEY again to confirm, the selected file (ex: 3P401001.XLS) will be erased then return to screen 1, or else press SETUP KEY in " N " option to return to screen 1.

B : Press ▼ in screen 1 to enter next setting function (Delete File → SD Format)

screen 1 ( 4-5-4 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| **Delete File:** | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 2 ( 4-5-4 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| **Delete File:** | Y OR N | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

## 4-5-5 SD Format : Formatting function for SD CARD

A : The indicator " Y or N " will appear on right side display of the option while pressing SHIFT KEY continuously at least two seconds, and press ▲ the display will show " Y " in highlight as screen 2, press SETUP KEY again to confirm to format SD CARD then return to screen 1, or else press SETUP KEY in " N " option return to screen 1.

B : Press ▼ in screen 1 to enter next setting function ( SD Format → PT ).

screen 1 ( 4-5-5 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| **SD Format:** | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year | Month | Date | Hour | Minute | Second |
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 2 ( 4-5-5 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| **SD Format:** | Y OR N | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year | Month | Date | Hour | Minute | Second |
| 2010 | 11 | 13 | 14 | 37 | 25 |

## 4-5-6 PT: Set the Potential Transformer

A : When press SHIFT KEY once, the symbol " SHIFT1 " will disappear as screen 2 at this time press ▲ or ▼ can adjust to expect PT values, the adjusting numbers are from 1 to 1000.

*Remark : When press ▲ or ▼ > 2 sec, the setting no. will change fast.*

B : Press SHIFT KEY once again will return to screen 1 then press ▼ to enter next setting function ( PT → CT ).

screen 1 ( 4-5-6 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| **PT:** | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year / Month | Date | Hour | Minute | Second | |
| 2010 / 11 | 13 | 14 | 37 | 25 | |

screen 2 ( 4-5-6 )

| | | | | |
|---|---|---|---|---|
| Folder Name: | WTA01 | | | **SETUP** |
| File Name: | 3P401001.XLS | | | |
| REC Date: | 2008-11-28 00:03:17 | | | |
| Sampling Time: | 2 | | | |
| Delete File: | 0 % | Decimal: | Basic | |
| SD Format: | 0 % | Clamp Type: | CP1201 | |
| Use Size: | 388 KB | A Range: | 20A | |
| Free Size: | 1946 MB | V Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | |
| **PT:** | 1 : 1 | V1 | I1 | P1 |
| CT: | 1 : 1 | S1 | Q1 | PF1 |
| Beep: ON | | Φ1 | WH | FREQ |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

## 4-5-7 CT: Set the Current Transformer

A : When press SHIFT KEY once, the symbol " SHIFT1 " will disappear as screen 2 at this time press ▲ or ▼ can adjust to expect CT values, the adjusting numbers are from 1 to 600.

*Remark : When press ▲ or ▼ > 2 sec, the setting no. will change fast.*

B : Press SHIFT KEY once again will return to screen 1 then press ▼ to enter next setting function ( CT → BEEP ). again will return to screen 1 then press ▼ to enter next setting function ( CT → BEEP ).

screen 1 ( 4-5-7 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| **CT:** | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year | Month | Date | Hour | Minute | Second |
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 2 ( 4-5-7 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| **CT:** | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year | Month | Date | Hour | Minute | Second |
| 2010 | 11 | 13 | 14 | 37 | 25 |

## 4-5-8 Beep: Control the buzzer to ON/OFF

A : When press SHIFT KEY once the symbol " SHIFT1 " will disappear as screen 2, at this time press ▲ or ▼ to control the buzzer to ON/OFF.

B : Press SHIFT KEY once again will return to screen 1 then press ▼ to enter next setting function ( BEEP → Decimal type )

screen 1 ( 4-5-8 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| **Beep:** ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 2 ( 4-5-8 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| **Beep:** ON | | $\Phi 1$ | WH | FREQ | |
| Year | Month | Date | Hour | Minute | Second |
| 2010 | 11 | 13 | 14 | 37 | 25 |

4-5-9 Decimal Type: set the Decimal type to Basic ( .) or Euro ( , )



**The numerical data structure of SD card is default used the "  . " as the decimal, for example "20.6"  "1000.53" . But in certain countries  ( Europe ...) is used the " , " as the decimal point,  for example " 20,6 "  "1000,53". Under such situation,  it should change the Decimal character at first.**

A : When press SHIFT KEY once the symbol " SHIFT1 " will disappear as screen 2, at this time press ▲ or ▼ to select the Decimal type to " Basic " or " Euro ".

** Basic type :*
*The numerical data structure of SD card is default used the " . " as the decimal, for example "20.6" "1000.53" .*
** Euro type :*
*The numerical data structure of SD card is default used the " , " as the decimal, for example "20,6" "1000,53" .*

B : Press SHIFT KEY once again will return to screen 1 then press ▼ to enter next setting function ( Decimal type → Clamp type ).

screen 1 ( 4-5-9 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | **Decimal :** | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 2 ( 4-5-9 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | **Decimal :** | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

4-5-10 Clamp Type: set the clamp type to Lutron Clamp or other Clamp

A : When press SHIFT KEY once the symbol " SHIFT1 " will be disappeared and show as screen 2, at this time press ▲ or ▼ to select the Lutron standard clamp or other Clamp ( CP-200, CP-1201, CP-2000. CP-3000, Other ).

B : When select the different Clamp type, the V range and the A range will show the corresponding value.

C : Press SHIFT KEY once again will return to screen 1 then press ▼ to enter next setting function ( Clamp Type → A range ).

screen 1 ( 4-5-10 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | **Clamp Type:** | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 2 ( 4-5-10 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | **Clamp Type:** | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

## 4-5-11 A range Setting ( Current range Setting )

A : When press SHIFT KEY once the symbol " SHIFT1 " will be disappeared and show as screen 2, at this time press ▲ or ▼ to select A range to 20A to 2000A or 30A to 3000A.

** The setting value should accoding your Clamp type.*
** The CP-3000 clamp can set 30A, 300A, 3000A.*
** The CP-2000 clamp can set 20A, 200A, 2000A.*
** The CP-1201 clamp can set 20A, 200A, 1200A.*
** The CP-200 clamp can set 20A, 200A.*
** The Other clamp can set 20A, 200A, 2000A, 30A 300A, 3000A.*

***Attention :***
***The meter's A range ( Current range ) value should same as the Clamp's current selecting range value.***

B : Press SHIFT KEY once again will return to screen 1 then press ▼ to enter next setting function ( A Range → V range ).

screen 1 ( 4-5-11 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | **A** | **Range:** | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 2 ( 4-5-11 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | Basic | | |
| SD Format: | 0 % | Clamp Type: | CP1201 | | |
| Use Size: | 388 KB | **A** | **Range:** | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | $\Phi 1$ | WH | FREQ | |
| Year | Month | Date | Hour | Minute | Second |
| 2010 | 11 | 13 | 14 | 37 | 25 |

## 4-5-12 V range Setting ( Voltage range Setting )

A : When press SHIFT KEY once the symbol " SHIFT1 " will be disappeared and show as screen 2, at this time press ▲ or ▼ to select V range to 200mV, 300mV, 500mV, 1V, 2V, 3V.

** The setting function only available for the Other clamp.*

** The V range value of CP-200, CP-1201, CP-2000, CP-3000 will dfault to 200mV, it can not be adjusted.*

B : Press SHIFT KEY once again will return to screen 1 then press ▼ to enter next setting function ( A Range → RS232 OUT SEL ).

screen 1 ( 4-5-12 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | **V** | **Range:** | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 2 ( 4-5-12 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | **V** | **Range:** | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

## 4-5-13 RS232 Out Sel setting

A : When press SHIFT KEY continuously at least two seconds as screen 2 and now press ▲ or ▼ to select the item that intend to output, maximum up to nine items, when the cursor stops on the selected item and then press SETUP KEY again, the selected item will be displayed in highlight.

B : If the selected items are over nine, the low right display will show indicator " full " as screen 3.

C : After the selecting is completed, press SHIFT KEY continuously at least two seconds again will return to screen 1 and show all the selected items at the same time.

D : Press ▼ in screen 1 to enter next setting function ( RS232 Out Sel → Year )

screen 1 ( 4-5-13 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | **RS232 Out Sel:** | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |

| Year | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 2 ( 4-5-13 )

## RS232 OUTPUT SELECT

| | | | | | |
|---|---|---|---|---|---|
| 1. | V12 | 12. | P3 | 23. | PF2 |
| 2. | V23 | 13. | PΣ | 24. | PF3 |
| 3. | V31 | 14. | **S1** | 25. | PFΣ |
| **4.** | V1 | 15. | S2 | 26. | PFH |
| 5. | V2 | 16. | S3 | 27. | **Φ1** |
| 6. | V3 | 17. | SΣ | 28. | Φ 2 |
| 7. | **I1** | 18. | **Q1** | 29. | Φ 3 |
| 8. | I2 | 19. | Q2 | 30. | **WH** |
| 9. | I3 | 20. | Q3 | 31. | SH |
| 10. | **P1** | 21. | QΣ | 32. | QH |
| 11. | P2 | 22. | **PF1** | 33. | **FREQ** |

screen 3 ( 4-5-13 )

## RS232 OUTPUT SELECT

| | | | | | |
|---|---|---|---|---|---|
| 1. | V12 | 12. | P3 | 23. | PF2 |
| 2. | V23 | 13. | PΣ | 24. | PF3 |
| 3. | V31 | 14. | **S1** | 25. | PFΣ |
| **4.** | **V1** | 15. | S2 | 26. | PFH |
| 5. | V2 | 16. | S3 | 27. | **Φ1** |
| 6. | V3 | 17. | SΣ | 28. | Φ 2 |
| 7. | I1 | 18. | **Q1** | 29. | Φ 3 |
| 8. | I2 | 19. | Q2 | 30. | **WH** |
| 9. | I3 | 20. | Q3 | 31. | SH |
| 10. | **P1** | 21. | QΣ | 32. | QH |
| 11. | P2 | 22. | **PF1** | 33. | **FREQ** |

**FULL**

## 4-5-14 Year/Month/Date/Hour/Minute/Second setting

A : When press SHIFT KEY once, the symbol " SHIFT1" will disappear as screen 2, at this time press ▲ or ▼ to adjust expect numbers, and press ▲ or ▼ continuously at least two seconds can skip the numbers faster.

B : When press SHIFT KEY once, the symbol " SHIFT1" will appear as screen 1, at this time press ▼ to enter next setting function ( Year → Month ).

C : The settings about ( Month → Date ), (Date → Hour ), (Hour → Minute ), ( Minute → Second ) are same as above step A and step B.

D : In this setting function ( Year → Minute ), press ▲ or ▼ in addition to adjust the numbers, and the setting value will also be saved during the adjusting.

E : In the function of setting " second ", press ▲ or ▼ to adjust numbers. at this point the number of second is at a standstill condition and then press setup key that will save setting value and also start counting function of " second ".

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | **SHIFT 1** |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | A | Range: | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ 1 | WH | FREQ | |

| **Year** | Month | Date | Hour | Minute | Second |
|---|---|---|---|---|---|
| 2010 | 11 | 13 | 14 | 37 | 25 |

screen 1
( 4-5-14 )

| | | | | | | |
|---|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | | |
| Sampling Time: | 2 | | | | | |
| Delete File: | 0 % | Decimal: | | Basic | | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | | |
| Use Size: | 388 KB | A | Range: | 20A | | |
| Free Size: | 1946 MB | V | Range: | 200mV | | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | | |
| Beep: ON | | Φ 1 | WH | FREQ | | |
| **Year** | Month | Date | Hour | Minute | Second | |
| 2010 | 11 | 13 | 14 | 37 | 25 | |

screen 2
( 4-5-14 )

4-5-15 When all settings are completed, press EXIT KEY to return measuring screen.

4-5-16 The descriptions about SD CARD memory space

A : Use Size - To show the space data numbers that have been used.
B : Free Size - To show the data numbers of balance space.
C : Total Size - To show the data numbers of total space.
D : Typical SD CARD and SDHC both can be used with the instrument, except the SD CARD memory size is less than 32MB.

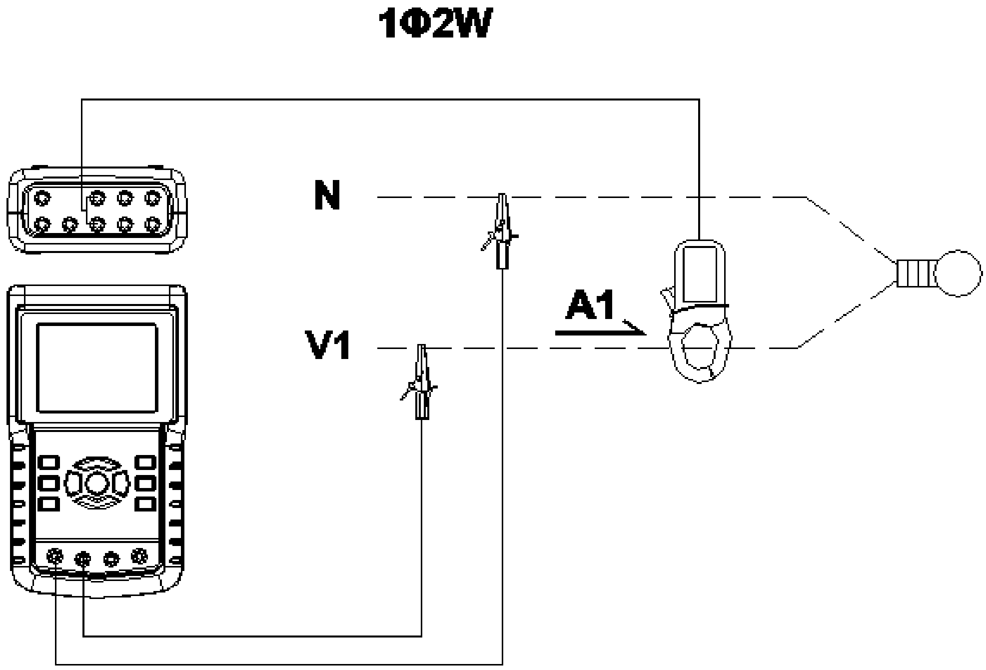
4-5-17 RESET KEY : Press this key to reboot the instrument

# 5. MEASURING PROCEDURES

***5-1 1Φ2W ( one phase by two wires ) measurement***

A : Diagram

SCREEN 1 ( 5-1 )




B : Operation Instructions:

B-1 : Power on the instrument by pressing POWER KEY, and then press 1Φ 3Φ KEY to select the 1Φ 2W system, the selected name of system will be appeared on bottom left display of screen 2.

B-2 : Connect the line voltage L1, Vn ( Neutral ) to V1 and N terminals of the instrument.

B-3: Place the conductor of CP-1201 (A1)to A1 as screen 1.

B-4: Connect the output of clamp meter " CP-1200(A1) " to A1 terminal of the instrument.

B-5: The related measuring factors will be appeared on display, about the instruction of factor please refer appendix 1 ( 5-12, page 51 ).

screen 2 ( 5-1 )

V 1 : 0.0 V
A 1 : 0.00 A

P 1 : - 0.000KW    P F 1 : - 0.00
S 1 : 0.000KVA    P F H : 0.00
Q 1 : - 0.000KVAR    Φ 1 : - 0.0°

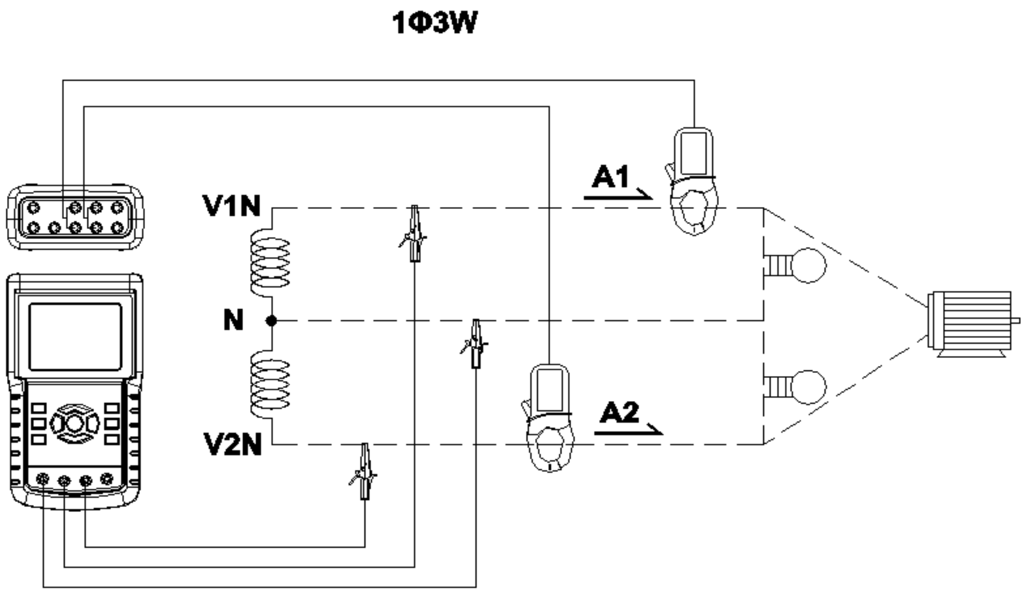
W H : 0.000KWH
S H : 0.000KVAH
Q H : 0.000KVARH    F R E Q : 50.1 Hz

**CP1201 20A**    **1Φ 2W**    **SEC: 2**    **CT: 1**    **PT: 1**

## *5-2 1Φ 3W (one phase by three wires) measurement*

A : Diagram

screen1 ( 5-2 )



B : Operation Instructions:

B-1 : Power on the instrument by pressing POWER KEY, and then press 1Φ 3Φ KEY to select the 1Φ 3W system, the selected name of system will be appeared on bottom left display of screen 2.

B-2 : Connect the line voltage L1, L2 and Vn (Neutral) to V1, V2 and N terminals of the instrument.

B-3 : Place the conductor of CP-1201(A1), CP-1201(A2) hook to A1 and A2 as screen 1.

B-4 : Connect the outputs of clamp meter CP-1201(A1)、CP-1201(A2) to A1 and A2 terminals of the instrument.

B-5 : The related measuring factors will be appeared on display, about the instruction of factor please refer appendix 1 ( 5-12, page 51 ).

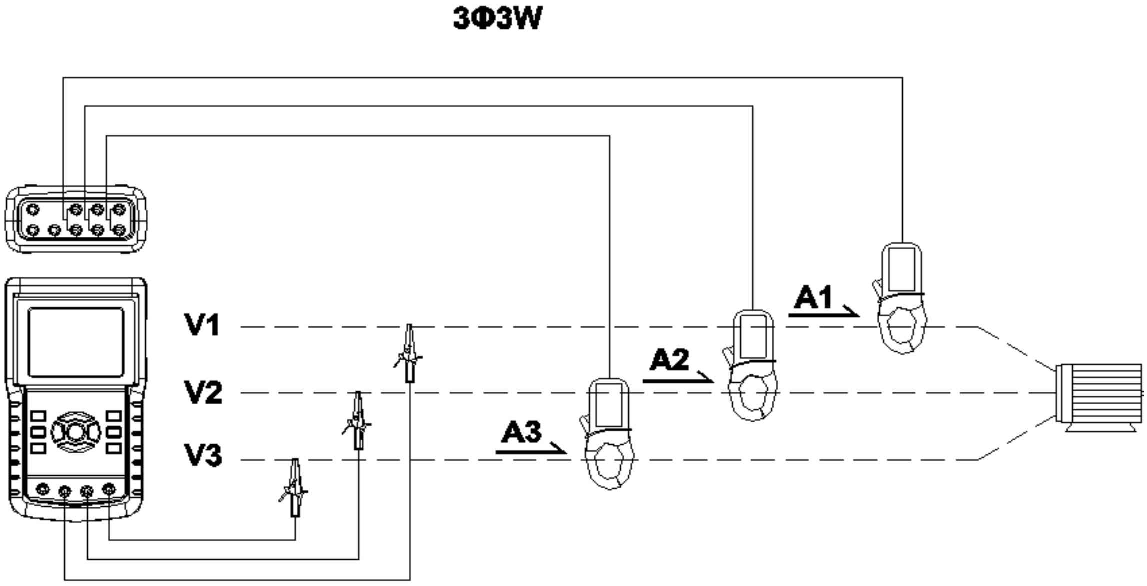
screen 2 ( 5-2 )

| | | | | | |
|---|---|---|---|---|---|
| V 1 : | 0.0 V | | P 1 : | - 0.000KW | |
| V 2 : | 0.0 V | | P 2 : | - 0.000KW | |
| A 1 : | 0.00 A | | S 1 : | 0.000KVA | |
| A 2 : | 0.00 A | | S 2 : | 0.000KVA | |
| Q 1 : | - 0.000KVAR | | | | |
| Q 2 : | - 0.000KVAR | | | | |
| **PΣ :** | 0.000 KW | **SΣ :** | 0.000 KVA | **QΣ :** | 0.000 KVAR |
| **PF1:** | - 0.00 | **PF2:** | - 0.00 | **PFΣ :** | 0.00 |
| **PFH:** | 0.00 | **Φ1:** | - 0.0° | **Φ2:** | - 0.0° |
| **WH:** | 0.000 KWH | | **SH:** | 0.000 KVAH | |
| **QH:** | 0.000 KVARH | | **FREQ:** | 50.0 Hz | |
| **CP1201 20A** | **1Φ3W** | **SEC: 2** | **CT: 1** | **PT: 1** | |

## *5-3 3Φ3W (three phases by three wires) measurement*

A : Diagram

screen 1 ( 5-3 )




B : Operation Instructions:

B-1 : Power on the instrument by pressing POWER KEY, and then press 1Φ 3Φ KEY to select the 3Φ 3W system, the selected name of system will be appeared on bottom left display of screen 2.

B-2: Connect the line voltage L1, L2 and L3 to V1, V2 and V3 terminals of the instrument.

B-3: Place the conductor of CP-1201(A1), CP-1201(A2), CP-1201(A3) hook to A1, A2 ,A3 as screen 1.

B-4 : Connect the outputs of clamp meter CP-1201(A1) , CP-1201(A2), CP-1201(A3) to A1, A2, A3 terminals of the instrument.

B-5: The related measuring factors will be appeared on display, about the instruction of factor please refer appendix 1 ( 5-12, page 51 ).

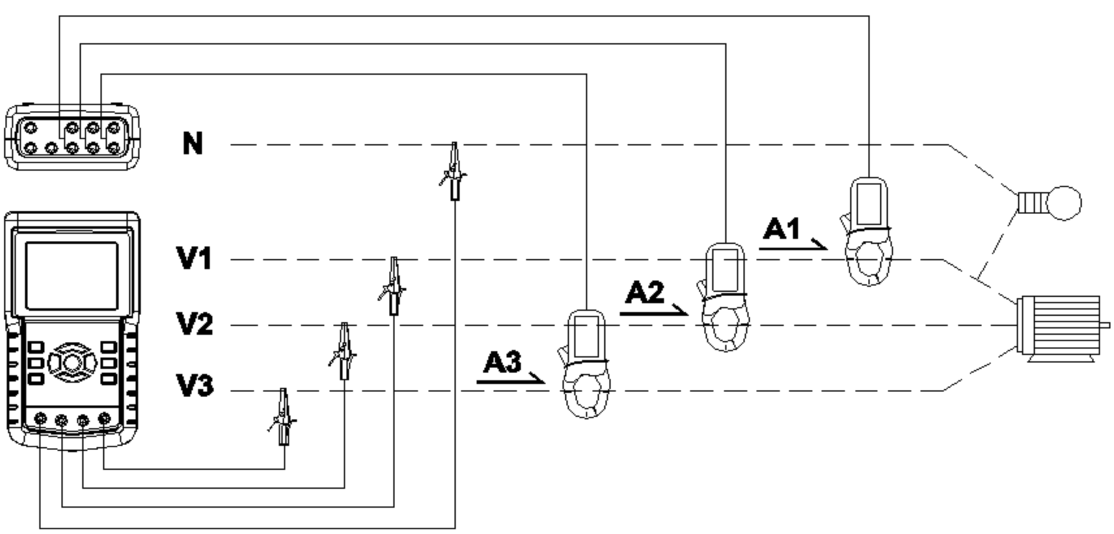
screen 2 ( 5-3 )

| | | | | | |
|---|---|---|---|---|---|
| V 1 2 : | 0.0 | V | A 1 : | 0.00 | A |
| V 2 3 : | 0.0 | V | A 2 : | 0.00 | A |
| V 3 1 : | 0.0 | V | A 3 : | 0.00 | A |
| P Σ : | - 0.000 KW | | | | |
| S Σ : | 0.000 KVA | | | | |
| Q Σ : | 0.000 KVAR | | | | |
| PFΣ : | 0.00 | | P F H : | 0.00 | |
| **WH:** | 0.000 KWH | | **SH:** | 0.000 KVAH | |
| **QH:** | 0.000 KVARH | | **FREQ:** | 50.0 Hz | |
| **CP1201 20A** | **3Φ3W** | **SEC: 2** | **CT: 1** | **PT: 1** | |

## *5-4 3Φ4W (three phases by four wires) measurement*

A : Diagram

**3Φ4W**




screen 1 ( 5-4 )

B: Operation Instructions:

B-1 : Power on the instrument by pressing POWER KEY, and then press 1Φ 3Φ KEY to select the 3Φ 4W system, the selected name of system will be appeared on bottom left display of screen 2.

B-2 : Connect the line voltage L1, L2, L3 and Vn to V1, V2, V3 and N terminals of the instrument.

B-3 : Place the conductor of CP-1201(A1), CP-1201(A2)、CP-1201(A3) hook to A1, A2, A3 as screen 1.

B-4 : Connect the outputs of clamp meter CP-1201(A1), CP-1201(A2), CP-1201(A3) to A1、A2、A3 terminals of the instrument.

B-5 : The related measuring factors will be appeared on display, about the instruction of factor please refer appendix 1 ( 5-12, page 51 ).

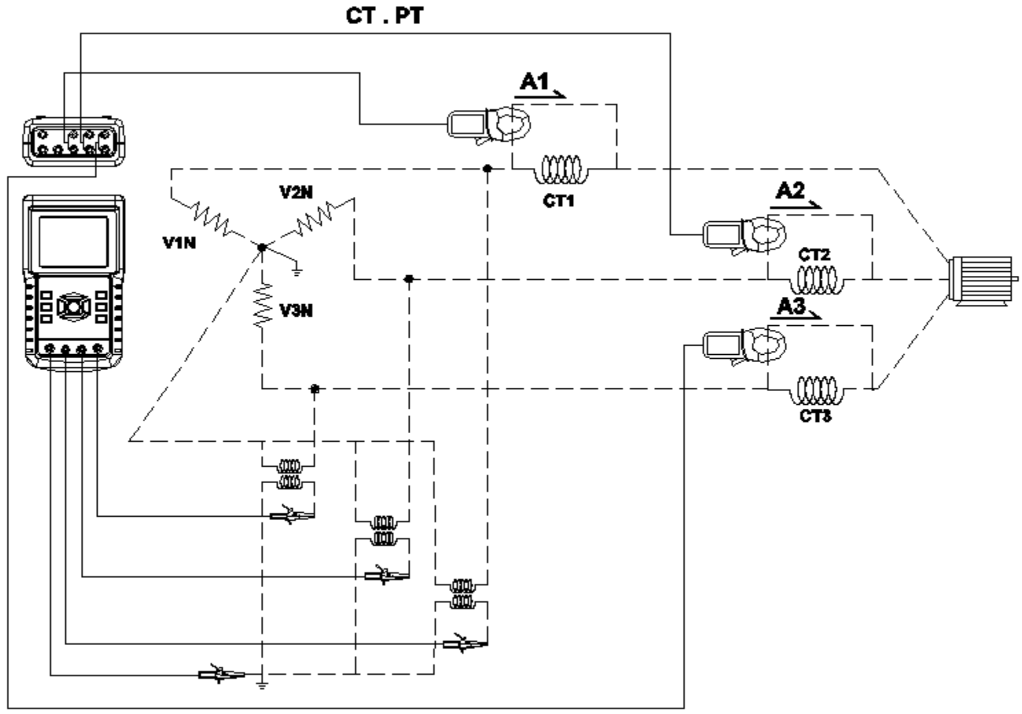
screen 2 ( 5-4 )

| | | | | | |
|---|---|---|---|---|---|
| **V12:** | 0.0 V | **V1:** | 0.0 V | **A1:** | 0.00 A |
| **V23:** | 0.0 V | **V2:** | 0.0 V | **A2:** | 0.00 A |
| **V31:** | 0.0 V | **V3:** | 0.0 V | **A3:** | 0.00 A |
| **P1:** | - 0.000 KW | **S1:** | 0.000 KVA | **Q1:** | - 0.000 KVAR |
| **P2:** | - 0.000 KW | **S2:** | 0.000 KVA | **Q2:** | - 0.000 KVAR |
| **P3:** | - 0.000 KW | **S3:** | 0.000 KVA | **Q3:** | - 0.000 KVAR |
| **PΣ** | - 0.000 KW | **SΣ :** | 0.000 KVA | **QΣ :** | - 0.000 KVAR |
| **PF1:** | - 0.00 | **PF2:** | - 0.00 | **PF3:** | - 0.00 |
| **PFΣ :** | 0.00 | **PFH:** | 0.00 | | |
| **Φ1:** | - 0.0° | **Φ2:** | - 0.0° | **Φ3:** | - 0.0° |
| **WH:** | 0.000 KWH | **SH:** | 0.000 KVAH | | |
| **QH:** | 0.000 KVARH | **FREQ:** | 0.0 Hz | | |
| **CP1201 20A** | **3Φ4W** | **SEC: 2** | **CT: 1** | **PT: 1** | |

## *5-5 The CT and PT measurement*

A : Diagram

screen 1 ( 5-5 )




B : Operation Instructions

B-1 : Power on the instrument by pressing POWER KEY, and then press 1Φ 3Φ KEY to select the 3Φ 4W system, the selected name of system will be appeared on bottom left display of screen 2.

B-2 : Connect the line voltage L1, L2, L3 and Vn to V1, ,V2, V3 and N terminals of the instrument.

B-3 : Place the conductor of CP-1201(A1), CP-1201(A2), CP-1201(A3) hook to A1, A2 , A3 as screen 1.

B-4: Connect the outputs of clamp meter CP-1201(A1), CP-1201(A2), CP-1201(A3) to A1, A2, A3 terminals of the instrument.

B-5: The related measuring factors will be appeared on display, about the instruction of factor please refer appendix 1 ( 5-12, page 51 ).

screen 2 ( 5-5 )

| | | | | | |
|---|---|---|---|---|---|
| **V12:** | 0.0 V | **V1:** | 0.0 V | **A1:** | 0.00 A |
| **V23:** | 0.0 V | **V2:** | 0.0 V | **A2:** | 0.00 A |
| **V31:** | 0.0 V | **V3:** | 0.0 V | **A3:** | 0.00 A |
| **P1:** | - 0.000 KW | **S1:** | 0.000 KVA | **Q1:** | - 0.000 KVAR |
| **P2:** | - 0.000 KW | **S2:** | 0.000 KVA | **Q2:** | - 0.000 KVAR |
| **P3:** | - 0.000 KW | **S3:** | 0.000 KVA | **Q3:** | - 0.000 KVAR |
| **PΣ** | - 0.000 KW | **SΣ :** | 0.000 KVA | **QΣ :** | - 0.000 KVAR |
| **PF1:** | - 0.00 | **PF2:** | - 0.00 | **PF3:** | - 0.00 |
| **PFΣ :** | 0.00 | **PFH:** | 0.00 | | |
| **Φ1:** | - 0.0° | **Φ2:** | - 0.0° | **Φ3:** | - 0.0° |
| **WH:** | 0.000 KWH | **SH:** | 0.000 KVAH | | |
| **QH:** | 0.000 KVARH | **FREQ:** | 0.0 Hz | | |
| **CP1201 20A** | **3Φ4W** | **SEC: 2** | **CT: 1** | **PT: 1** | |

### *5-6 ZERO adjustment for Watt Hour*

If reset the " Exit key button " ( 3-8, Fig. 1 ) continuously and > 6 seconds, the measurement value of " WH ", " SH ", " QH " will reset to Zero value.

## *5-7 Data Logger Function*

A : Press REC KEY once to start the data record function.

A-1 : If the bottom right shows as " Change Card ", it indicates the memory space is already full either or the SD CARD exist some wrong.

A-2 : If the SD CARD is normal, the data logger function will start to be executed.

| | | | | | |
|---|---|---|---|---|---|
| **V12:** | 0.0 V | **V1:** | 0.0 V | **A1:** | 0.00 A |
| **V23:** | 0.0 V | **V2:** | 0.0 V | **A2:** | 0.00 A |
| **V31:** | 0.0 V | **V3:** | 0.0 V | **A3:** | 0.00 A |
| **P1:** | - 0.000 KW | **S1:** | 0.000 KVA | **Q1:** | - 0.000 KVAR |
| **P2:** | - 0.000 KW | **S2:** | 0.000 KVA | **Q2:** | - 0.000 KVAR |
| **P3:** | - 0.000 KW | **S3:** | 0.000 KVA | **Q3:** | - 0.000 KVAR |
| **PΣ** | - 0.000 KW | **SΣ :** | 0.000 KVA | **QΣ :** | - 0.000 KVAR |
| **PF1:** | - 0.00 | **PF2:** | - 0.00 | **PF3:** | - 0.00 |
| **PFΣ :** | 0.00 | **PFH:** | 0.00 | | |
| **Φ1:** | - 0.0° | **Φ2:** | - 0.0° | **Φ3:** | - 0.0° |
| **WH:** | 0.000 KWH | **SH:** | 0.000 KVAH | | |
| **QH:** | 0.000 KVARH | **FREQ:** | 0.0 Hz | | |
| **CP1201 20A** | **3Φ4W** | **SEC: 2** | **CT: 1** | **PT: 1** | **Change Card** |

B : The bottom right display will show the recorded data points.

B-1 : Each file can record up to 30,000 data points as screen 1 when the record points exceed 30,000 points, system will create a new file automatically. (For example, WTA01001.XLS will be replaced by WTA01002.XLS)

B-2 : While pressing REC KEY twice, the data logger function will stop to execute, the record points will disappear on bottom right display as screen 2.

screen 1 ( 5-6 B )

| | | | | | |
|---|---|---|---|---|---|
| **V12:** | 0.0 V | **V1:** | 0.0 V | **A1:** | 0.00 A |
| **V23:** | 0.0 V | **V2:** | 0.0 V | **A2:** | 0.00 A |
| **V31:** | 0.0 V | **V3:** | 0.0 V | **A3:** | 0.00 A |
| **P1:** | - 0.000 KW | **S1:** | 0.000 KVA | **Q1:** | - 0.000 KVAR |
| **P2:** | - 0.000 KW | **S2:** | 0.000 KVA | **Q2:** | - 0.000 KVAR |
| **P3:** | - 0.000 KW | **S3:** | 0.000 KVA | **Q3:** | - 0.000 KVAR |
| **PΣ** | - 0.000 KW | **SΣ :** | 0.000 KVA | **QΣ :** | - 0.000 KVAR |
| **PF1:** | - 0.00 | **PF2:** | - 0.00 | **PF3:** | - 0.00 |
| **PFΣ :** | 0.00 | **PFH:** | 0.00 | | |
| **Φ1:** | - 0.0° | **Φ2:** | - 0.0° | **Φ3:** | - 0.0° |
| **WH:** | 0.000 KWH | | | **SH:** | 0.000 KVAH |
| **QH:** | 0.000 KVARH | | | **FREQ:** | 0.0 Hz |

| | | | | | |
|---|---|---|---|---|---|
| **CP1201 20A** | **3Φ4W** | **SEC: 2** | **CT: 1** | **PT: 1** | **REC 9** |

screen 2 ( 5-6 B )

| | | | | | |
|---|---|---|---|---|---|
| **V12:** | 0.0 V | **V1:** | 0.0 V | **A1:** | 0.00 A |
| **V23:** | 0.0 V | **V2:** | 0.0 V | **A2:** | 0.00 A |
| **V31:** | 0.0 V | **V3:** | 0.0 V | **A3:** | 0.00 A |
| **P1:** | - 0.000 KW | **S1:** | 0.000 KVA | **Q1:** | - 0.000 KVAR |
| **P2:** | - 0.000 KW | **S2:** | 0.000 KVA | **Q2:** | - 0.000 KVAR |
| **P3:** | - 0.000 KW | **S3:** | 0.000 KVA | **Q3:** | - 0.000 KVAR |
| **PΣ** | - 0.000 KW | **SΣ :** | 0.000 KVA | **QΣ :** | - 0.000 KVAR |
| **PF1:** | - 0.00 | **PF2:** | - 0.00 | **PF3:** | - 0.00 |
| **PFΣ :** | 0.00 | **PFH:** | 0.00 | | |
| **Φ1:** | - 0.0° | **Φ2:** | - 0.0° | **Φ3:** | - 0.0° |
| **WH:** | 0.000 KWH | | | **SH:** | 0.000 KVAH |
| **QH:** | 0.000 KVARH | | | **FREQ:** | 0.0 Hz |

| | | | | |
|---|---|---|---|---|
| **CP1201 20A** | **3Φ4W** | **SEC: 2** | **CT: 1** | **PT: 1** |

### *5-8 Data HOLD Function*

A: During the measurement, press HOLD KEY once, the bottom right display will show " HOLD symbol as screen 1.

B: Press the HOLD KEY twice will disable the Data HOLD function and the " HOLD" symbol will disappear in the meantime

screen 1 ( 5-7 )

| | | | | | |
|---|---|---|---|---|---|
| **V12:** | 0.0 V | **V1:** | 0.0 V | **A1:** | 0.00 A |
| **V23:** | 0.0 V | **V2:** | 0.0 V | **A2:** | 0.00 A |
| **V31:** | 0.0 V | **V3:** | 0.0 V | **A3:** | 0.00 A |
| **P1:** | - 0.000 KW | **S1:** | 0.000 KVA | **Q1:** | - 0.000 KVAR |
| **P2:** | - 0.000 KW | **S2:** | 0.000 KVA | **Q2:** | - 0.000 KVAR |
| **P3:** | - 0.000 KW | **S3:** | 0.000 KVA | **Q3:** | - 0.000 KVAR |
| **PΣ** | - 0.000 KW | **SΣ :** | 0.000 KVA | **QΣ :** | - 0.000 KVAR |
| **PF1:** | - 0.00 | **PF2:** | - 0.00 | **PF3:** | - 0.00 |
| **PFΣ :** | 0.00 | **PFH:** | 0.00 | | |
| **Φ1:** | - 0.0° | **Φ2:** | - 0.0° | **Φ3:** | - 0.0° |
| **WH:** | 0.000 KWH | | | **SH:** | 0.000 KVAH |
| **QH:** | 0.000 KVARH | | | **FREQ:** | 0.0 Hz |

| | | | | | |
|---|---|---|---|---|---|
| **CP1201 20A** | **3Φ4W** | **SEC: 2** | **CT: 1** | **PT: 1** | **HOLD** ◄— |

screen 2 ( 5-7 )

| | | | | | |
|---|---|---|---|---|---|
| **V12:** | 0.0 V | **V1:** | 0.0 V | **A1:** | 0.00 A |
| **V23:** | 0.0 V | **V2:** | 0.0 V | **A2:** | 0.00 A |
| **V31:** | 0.0 V | **V3:** | 0.0 V | **A3:** | 0.00 A |
| **P1:** | - 0.000 KW | **S1:** | 0.000 KVA | **Q1:** | - 0.000 KVAR |
| **P2:** | - 0.000 KW | **S2:** | 0.000 KVA | **Q2:** | - 0.000 KVAR |
| **P3:** | - 0.000 KW | **S3:** | 0.000 KVA | **Q3:** | - 0.000 KVAR |
| **PΣ** | - 0.000 KW | **SΣ :** | 0.000 KVA | **QΣ :** | - 0.000 KVAR |
| **PF1:** | - 0.00 | **PF2:** | - 0.00 | **PF3:** | - 0.00 |
| **PFΣ :** | 0.00 | **PFH:** | 0.00 | | |
| **Φ1:** | - 0.0° | **Φ2:** | - 0.0° | **Φ3:** | - 0.0° |
| **WH:** | 0.000 KWH | | | **SH:** | 0.000 KVAH |
| **QH:** | 0.000 KVARH | | | **FREQ:** | 0.0 Hz |

| | | | | |
|---|---|---|---|---|
| **CP1201 20A** | **3Φ4W** | **SEC: 2** | **CT: 1** | **PT: 1** |

## *5-9 BACKLIGHT KEY*

***Control the backlight function of LCD to ON/OFF***

## *5-10 A Range ( Current Range ) KEY function*

a) The A Range ( Current Range ) function key is used to change the current range quickly.

b) Press A RANGE KEY once will entry to screen as FOLLOWING " screen 1 ( 5-10 ) " , it is the same screen as " screen 2 ( 4-5-11 ) , page 32 ".

c) The detail Current range Setting procedures, please reafer to section " 4-5-11 A range Setting ( Current range Setting ), page 31 "

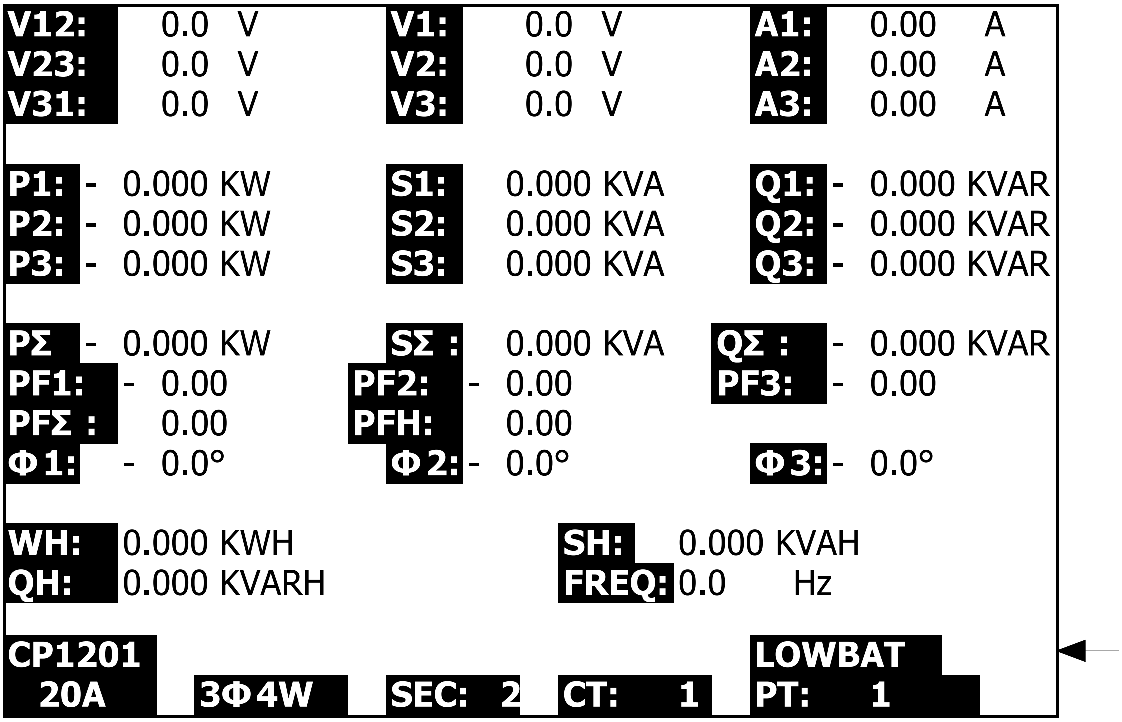
***Remark :***

***The function of the " A Range ( Current Range ) key " is available for the Clamp Type, A Range, V Range setting only.***

screen 1 ( 5-10 ) same as screen 2 ( 4-5-11 )

| | | | | | |
|---|---|---|---|---|---|
| Folder Name: | WTA01 | | | | **SETUP** |
| File Name: | 3P401001.XLS | | | | |
| REC Date: | 2008-11-28 00:03:17 | | | | |
| Sampling Time: | 2 | | | | |
| Delete File: | 0 % | Decimal: | | Basic | |
| SD Format: | 0 % | Clamp Type: | | CP1201 | |
| Use Size: | 388 KB | **A** | **Range:** | 20A | |
| Free Size: | 1946 MB | V | Range: | 200mV | |
| Total Size: | 1946 MB | RS232 Out Sel: | | | |
| PT: | 1 : 1 | V1 | I1 | P1 | |
| CT: | 1 : 1 | S1 | Q1 | PF1 | |
| Beep: ON | | Φ1 | WH | FREQ | |
| Year Month | Date | Hour | Minute | Second | |
| 2010 11 | 13 | 14 | 37 | 25 | |

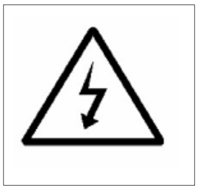
### *5-11 The LOWBAT screen: as show on lower right display of the following screen.*



## *5-12 Appendix 1*

＊ V12, V23, V31 : Line Voltage
＊ V1, V2, V3 : Phase Voltage
＊ A1, A2, A3 : Line Current
＊ P1, P2, P3 : True Power of each phase. (W)
＊ S1, S2, S3 : Apparent Power of each phase. (VA)
＊ Q1, Q2, Q3 : Reactive Power of each phase (VAR)
＊ PΣ : Total True Power (W)
＊ SΣ : Total Apparent Power (VA)
＊ QΣ : Total Reactive Power (VAR)
＊ PF1, PF2, PF3 : Power Factor of each phase
＊ PFΣ : Total Power Factor
＊ PFH : Long Term Average Power Factor ( WH/SH )
＊ Φ 1, Φ 2, Φ 3 : Phase Angle of each phase
＊ WH : Watt Hour
＊ SH : Apparent Power Hour
＊ QH : Reactive Power Hour
＊ 1Φ 2W : One phase by two wires
＊ 1Φ 3W : One phase by three wires
＊ 3Φ 3W : Three phases by three wires
＊ 3Φ 4W : Three phases by four wires
＊ SEC : The sampling time of data logger
＊ CT : Current transformer
＊ PT : Potential transformer

# 6. MAINTENANCE



**Caution :** ***Remove test leads before opening the battery cover or housing case !***

## *6-1 Cleaning*



**Caution :** ***Cleaning - Only use the dry cloth to clean the plastic case !***

## *6-2 Replacement of batteries*

1) When Display show the " LOWBAT " indicator ( ref. 5-11 page 50 ), it should change the batteries.
2) open the " Battery Cover " ( 3-19, Fig. 1 ) away from the instrument and remove the battery.
3) Replace with batteries (  DC 1.5V, AA/UM-3 battery X 8 PCs ) and reinstate the cover.

   **** When install the batteries, should make attention the battery polarity.***

4) Make sure the battery cover is secured after changing the batteries.

# 7. RS232 PC SERIAL OUTPUT

The instrument is provided an 3.5 mm dia. phone socket ( 3-16, Fig. 1 ) for RS232 computer interface socket.

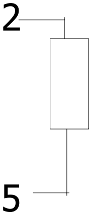
The connector output is a 16 digits data stream which can be utilized to the user's specific application.

**A RS232 lead with the following connection will be required to link the instrument with the PC serial input.**

| Meter (3.5 mm jack plug) | PC (9W 'D" Connector) |
|---|---|
| Center Pin | Pin 4 |
| Ground/shield | Pin 2 |
| | Pin 5 |

Center Pin...............................Pin 4

Ground/shield............................Pin 2



2.2 K resister

Pin 5

**The 16 digits data stream will be displayed in the following format :**

D15 D14 D13 D12 D11 D10 D9 D8 D7 D6 D5 D4 D3 D2 D1 D0

**Each digit indicate the following status :**

| | | | |
|---|---|---|---|
| D15 | Start Word | | |
| D14 | 4 | | |
| D13 | 1 | | |
| D12 & D11 | Annunciator for Display | | |
| | 31=HZ | C0 = MW | D1 = GW/Hr |
| | 32=DEGREE | C1 = GW | D2 = TW/Hr |
| | 48=K WATT | C2 = TW | D3 = KVA/Hr |
| | 50=ACV | C3 = MVA | D4 = MVA/Hr |
| | 52=ACA | C4 = GVA | D5 = GVA/Hr |
| | 64=KVA | C5 = TVA | D6 = TVA/Hr |
| | 65=KW/HR | C6 = KVAR | D7 = KVAR/Hr |
| | B6 = KACV | C7 = MVAR | D8 = MVAR/Hr |
| | B7 = MACV | C8 = GVAR | D9 = GVAR/Hr |
| | B8 = KACA | C9 = TVAR | E0 = TVAR/Hr |
| | B9 = MACA | D0 = MW/Hr | |
| D10 | Polarity<br>0 = Positive 1 = Negative | | |
| D9 | Decimal Point(DP), position from right to the left<br>0 = No DP, 1= 1 DP, 2 = 2 DP, 3 = 3 DP | | |
| D8 to D1 | Display reading, D1 = LSD, D8 = MSD<br>For example :<br>If the display reading is 1234, then D8 to D1 is : 00001234 | | |
| D0 | End Word | | |

**RS232 setting**

| | |
|---|---|
| Baud rate | 9600 |
| Parity | No parity |
| Data bit no. | 8 Data bits |
| Stop bit | 1 Stop bit |

# 8. Download the saving data from the SD card to the computer ( EXCEL software )

1) After execute the Data Logger function, take away the SD card out from the " SD card socket " ( 3-15, Fig. 1 ).
2) Plug in the SD card into the Computer's SD card slot ( if your computer build in this installation ) or insert the SD card into the " SD card adapter ". then connect the " SD card adapter " into the computer.
3) Power ON the computer and run the " EXCEL software ". Down load the saving data file ( for example the file name : 3P401001.XLS, 1P201001.XLS, 1P301001.XLS, 3P301001.XLS........) from the SD card to the computer. The saving data will present into the EXCEL software screen ( for example as following EXCEL data screens ) , then user can use those EXCEL data to make the further Data or Graphic analysis usefully.

EXCEL data screen 1 ( for example )

K21 =

| | A | B | C | D | E | F | G | H | I | J | K | L |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Position | Date | Time | V12 | Unit | V23 | Unit | V31 | Unit | V1 | Unit | V2 |
| 2 | 0 | 2009/1/14 | 08:58:53 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 3 | 0 | 2009/1/14 | 08:58:55 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 4 | 0 | 2009/1/14 | 08:58:57 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 5 | 0 | 2009/1/14 | 08:58:59 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 6 | 0 | 2009/1/14 | 08:59:01 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 7 | 0 | 2009/1/14 | 08:59:03 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 8 | 0 | 2009/1/14 | 08:59:05 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 9 | 0 | 2009/1/14 | 08:59:07 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 10 | 0 | 2009/1/14 | 08:59:09 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 11 | 0 | 2009/1/14 | 08:59:11 | 0 | ACV | 0 | ACV | 0 | ACV | 0 | ACV | 0 |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |

## EXCEL data screen 2 ( for example )

新細明體 12

開新檔案

Z21 =

| | N | O | P | Q | R | S | T | U | V | W | X | Y |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | V3 | Unit | A1 | Unit | A2 | Unit | A3 | Unit | P1 | Unit | P2 | Unit |
| 2 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 3 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 4 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 5 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 6 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 7 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 8 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 9 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 10 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 11 | 0 | ACV | 0 | ACA | 0 | ACA | 0 | ACA | 0 | KW | 0 | KW |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |

## EXCEL data screen 3 ( for example )

新細明體 12

AL21 =

名稱方塊

| | Z | AA | AB | AC | AD | AE | AF | AG | AH | AI | AJ | AK |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | P3 | Unit | P(SUM) | Unit | S1 | Unit | S2 | Unit | S3 | Unit | S(SUM) | Unit |
| 2 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 3 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 4 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 5 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 6 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 7 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 8 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 9 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 10 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 11 | 0 | KW | 0 | KW | 0 | KVA | 0 | KVA | 0 | KVA | 0 | KVA |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |

## EXCEL data screen 4 ( for example )

新細明體 12

AX21 =

| | AL | AM | AN | AO | AP | AQ | AR | AS | AT | AU | AV | AW |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Q1 | Unit | Q2 | Unit | Q3 | Unit | Q(SUM) | Unit | PF1 | Unit | PF2 | Unit |
| 2 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 3 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 4 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 5 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 6 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 7 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 8 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 9 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 10 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 11 | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | KVAR | 0 | | 0 | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |

EXCEL data screen 5 ( for example )

BJ21 =

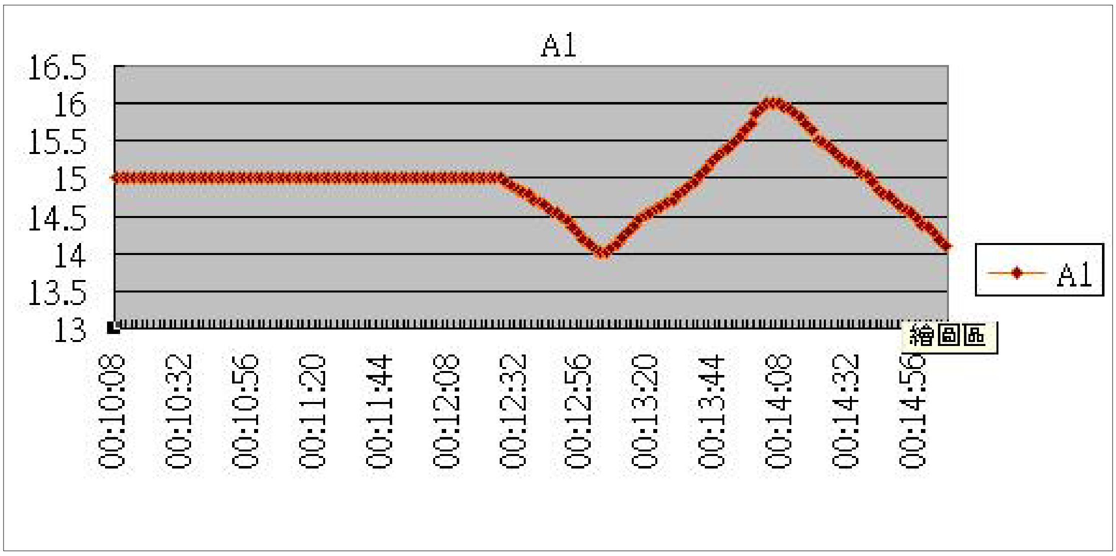
| | AX | AY | AZ | BA | BB | BC | BD | BE | BF | BG | BH | BI |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | PF3 | Unit | PF(SUM) | Unit | PFH | Unit | PHASE1 | Unit | PHASE2 | Unit | PHASE3 | Unit |
| 2 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 3 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 4 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 5 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 6 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 7 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 8 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 9 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 10 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 11 | 0 | | 0 | | 0 | | 0 | Degree | 0 | Degree | 0 | Degree |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |

EXCEL data screen 6 ( for example )

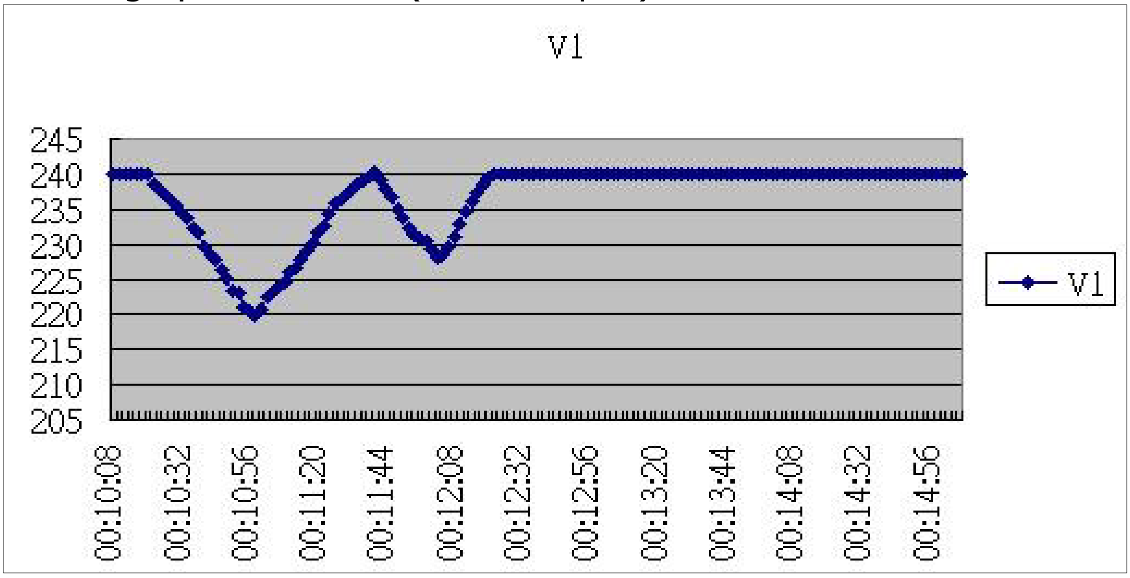
BV13 =

| | BJ | BK | BL | BM | BN | BO | BP | BQ | BR | BS | BT | BU |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | WH | Unit | SH | Unit | QH | Unit | FREQ | Unit | | | | |
| 2 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 3 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 4 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 5 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 6 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 7 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 8 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 9 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 10 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 11 | 0 | KWH | 0 | KVAH | 0 | KVARH | 0 | Hz | | | | |
| 12 | | | | | | | | | | | | |
| 13 | | | | | | | | | | | | |

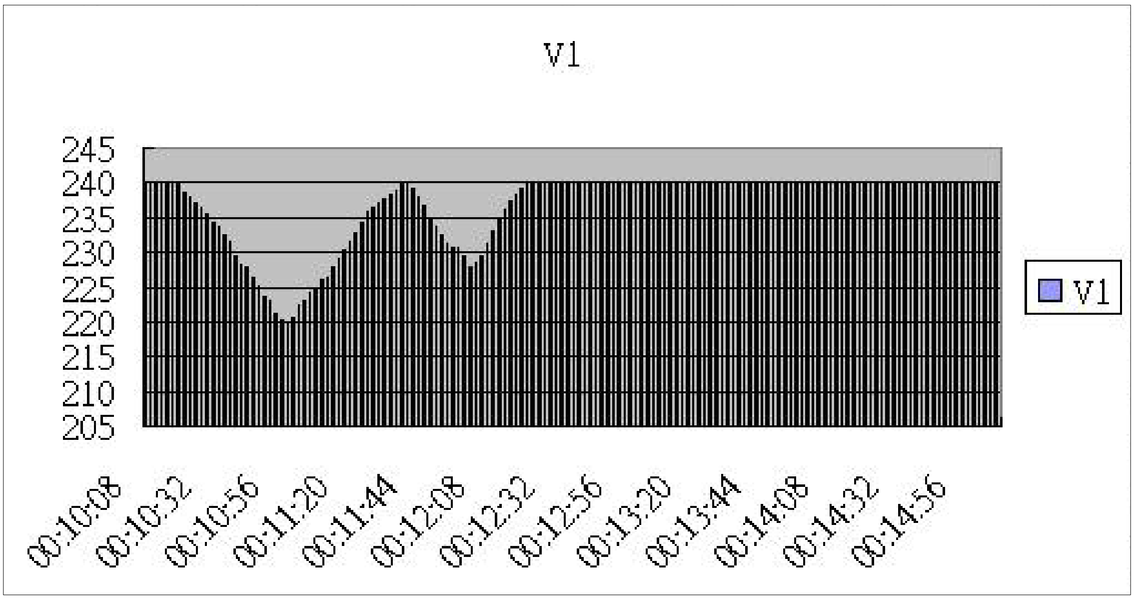
EXCEL graphic screen 1 ( for example )



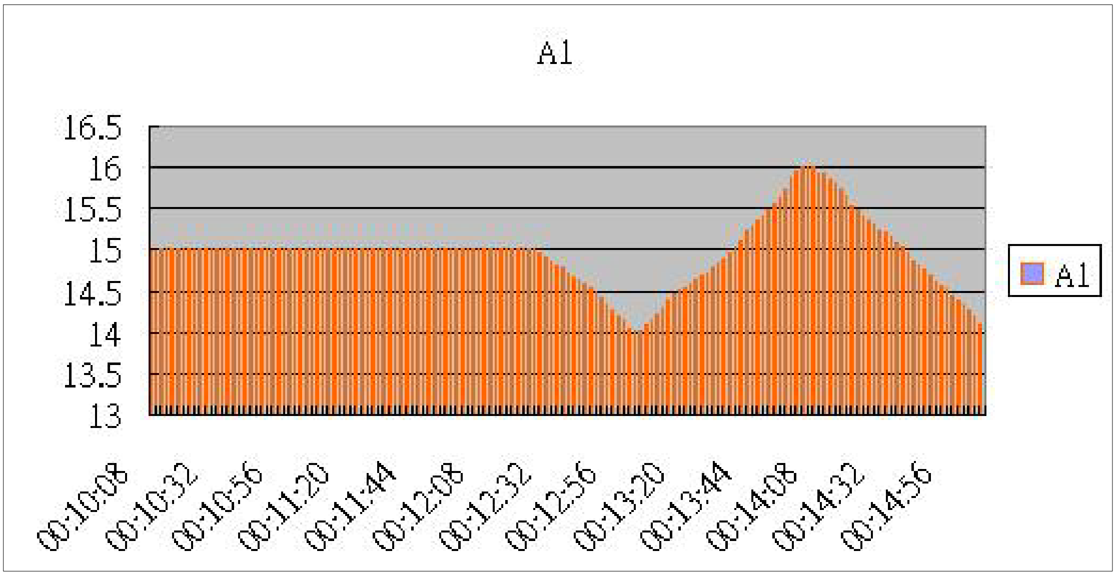
EXCEL graphic screen 2 ( for example )



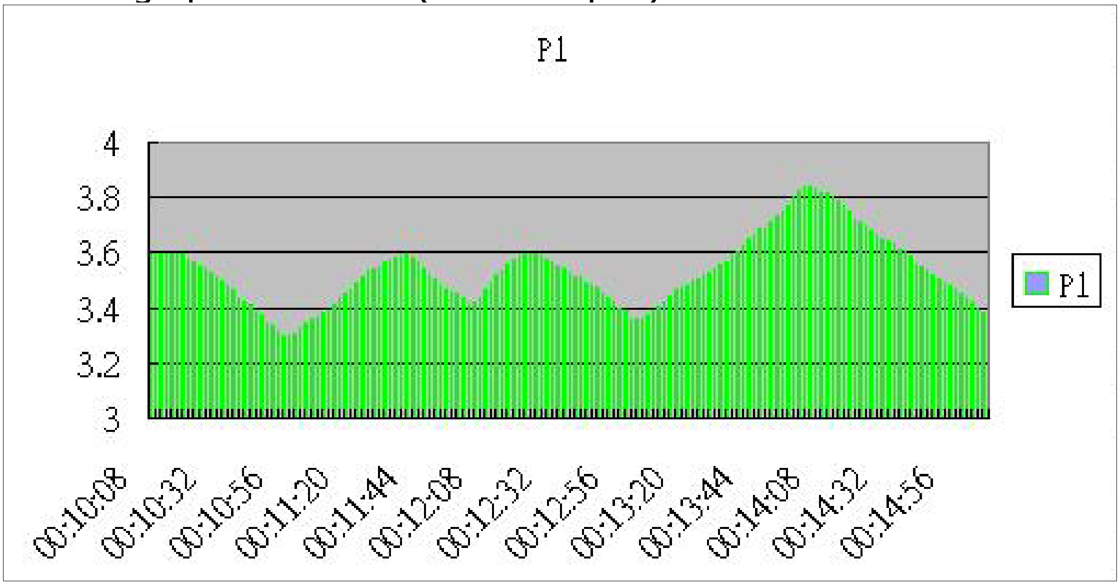

EXCEL graphic screen 3 ( for example )



EXCEL graphic screen 4 ( for example )




EXCEL graphic screen 5 ( for example )




# 9. PATENT

**The SD card installation for handheld instruments and the SD card data format structure ( Data to EXCEL file format ) already patent pending in the following countries :**

**U.S.A, CHINA, GERMANY, JAPAN, TAIWAN**

# ADDENDUM

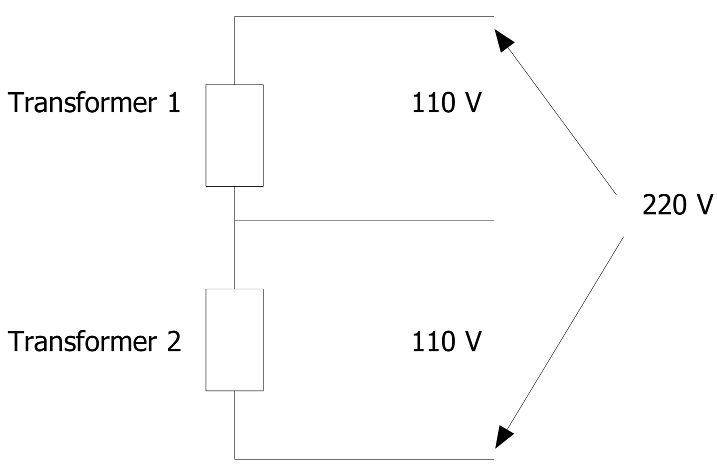
Question :
Can the DW-6093 be used to monitor power consumption of 3 different single phase circuits, which might be all on the same phase or on different phases?

**Answer :**
**If you have 3 different loads on 3 different phases or 3 different loads on the same phase drawing currents A1, A2 and A3 and the phase/s have a common neutral return or common ground, then power consumption can be monitored. This usually means the currents should be drawn from a single power source (the transformer).**

**Question :**
**If it can do this, what settings should be used? (ie. 3P4W or 1P3W etc?)**
**Answer :**
**3P4W**
**R-N >> A1**
**S-N >> A2**
**T-N >> A3**

Question :
Also I don't understand what the 1P3W setting is for, the user manual only seems to show it monitoring 2 circuits - can you please explain how this is to be used?

**Answer :**
**Please refer page 36.**
**It is used for specific single phase systems ( refer page 36 )which has two transformers**



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